

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



Applicant : BRUNN W. ROYSDEN, JR.)
Serial No. : 09/442,837)
Filed : November 16, 1999)
For : Keyboard with Interleaved)
Computer Components)

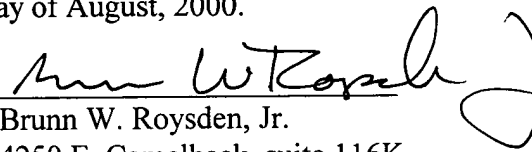
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Art Unit 2854

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MOTION FOR RECONSIDERATION

Motion is hereby made for reconsideration of the Office Action rejecting Claims 1 through 9. This Motion is supported by the attached Memorandum of Points and Authorities, the attached Motion to Amend, and by the entire file in this matter.

Respectfully submitted this 2nd day of August, 2000.


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MEMORANDUM OF POINTS AND AUTHORITIES



I. INTRODUCTION.

The examiner rejected the current Application, explaining as follows:

With respect to claims 1, 2 & 6, Roysden Jr. teaches a keyboard section structure (Fig. 4) including a plurality of keys (Fig. 3). Roysden Jr. also teaches of a key cap (20) working in conduction (connection?) With a switch means (28) these keys being included in a Bounding Key Set (see, col. 17, lines 5-13). Roysden, Jr. teaches of the spaces or sections included between the keys and the spaces which are defined in the bounded key set, which include a section key space, a bounding section key space, a section capless key space, and a bounding[unreadable] key space would be an obvious choice of design, due to the fact that any key the [sic] is not activated in its area or space would be considered undepressed, allowing for there to be space or lack thereof for any material or other components other than keyboard comments [components?] to operate. With respect to claims 3, 4 & 5, it would be an obvious choice to design to include "interleaved" components or other circuitry with [within?] a designated undepressed key space (see Roysden, Jr. col. 13, lines 1 - 18.)

I respectfully disagree that placing computer components within a keyboard is somehow an "obvious" extension of Roysden 5,575,576 for several reasons. Roysden itself dealt with a keyboard; it did not teach, or suggest in any fashion, that a computer could be interleaved or placed within a keyboard. The mechanics and the mechanism used in Roysden is different from that used in the current Application. Finally, the mathematics used to describe the claims in Roysden, while used to describe the interleaving of a computer within a keyboard, does not suggest *a priori* that computer components can be interleaved or placed within a keyboard. Each topic will be discussed in some detail. However, first, the "law of obviousness" needs to be discussed.

II. LAW.

A. Hindsight Cannot Be Used To Determine Obviousness.

The "law of obviousness" in patent law is reviewed in considerable detail in 35 U.S.C. § 103: *From Hotchkiss to Hand to Rich, the Obvious Patent Law Hall-Of-Famers*, by George M. Sirilla, 32 John Marshall Law Review, 437 to 580 (1999)(herein "Sirilla"). Without trying to repeat or even summarize what is stated there, we can glean the following as pertinent to the discussion here:

It is settled law that hindsight cannot be used to determine obviousness. *See, e.g. in re Dembiczak*, 175 F.3d 994, 998 (¶12) No. 98-1498 (Fed. Cir. 1999).

The AIPLA's model jury instructions caution against the use of hindsight and an "Obvious-to-Try" test (from *Sirilla* at 457, quoting AIPLA's model jury instructions):

OBVIOUSNESS-HINDSIGHT. ... “It is wrong to use the patent in suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit.”

OBVIOUS TO TRY. The evidence might indicate to you that what the inventors did was obvious to try. If so, this does not necessarily indicate the patent is invalid for obviousness. “Obvious to try” is not the standard. The standard is whether the invention as a whole would have been obvious to one of ordinary skill in the field to which the invention pertains at the time the invention was made.

STATE OF THE ART -- CANNOT USE HINDSIGHT. You are instructed that when you consider the prior art, whether in the form of writings, physical exhibits, or patents, you must consider them for what they actually disclose to one of ordinary skill in the art, and no more. *You cannot use hindsight to assemble the invention from parts made up of individual elements of the prior art devices, nor can you reconstruct any of the prior art devices or materials unless obvious to one of ordinary skill in the art to do so. [emphasis added]..*

The law has always been that hindsight cannot be used to determine. For example, *Sirilla* at 470-471, explains, quoting Justice McKenna in *Diamond Rubber Co. v. Consolidated Rubber Tire Co.*, 220 U.S. 428, 435, 437 (1911):

Knowledge after the event is always easy, and problems once solved present no difficulties, indeed, may be represented as never having had any, and expert witnesses may be brought forward to show that the new thing which seemed to have eluded the search of the world was always ready at hand and easy to be seen by a merely skillful attention. But the law has other tests of the invention than subtle conjectures of what might have been seen and yet was not.

... [T]he invention:

[M]ay be the successor, in a sense, of all that went before, a step only in the march of improvement, and limited, therefore, to its precise form and elements, as the patent in suit is conceded to be. *In its narrow and humble form it may not excite our wonder as may the broader or pretentious form, but it has as firm a right to protection. [emphasis in the original].*

In *Edison Electric Light Co. v. United States Electric Lighting Co.*, [52 F. 300 (2nd Cir. 1892)], the Second Circuit favorably considered Thomas Edison’s famous patent on electric light bulbs. The accused infringer argued that Edison’s substitution of carbon for platinum in a vacuum tube was an obvious improvement. *Sirilla* at 502-503.

The Second Circuit rejected the argument that the substitution of material was obvious, pointing to other failed attempts, including those that went down the road of using a vacuum.

[Sirilla continues (503-504) that this] philosophy was followed in *Westinghouse Electric & Manufacturing Co. v. Dayton Fan & Motor Co.* [106 F. 724, 728 (C.C.S.D. Ohio 1901), *aff'd* 118 F. 562 (6th Cir. 1902)], where the court rejected an argument that the patent at issue was invalid in view of prior patents:

Now, it is said that in view of the prior art, including the Tesla patents of May 1, 1888, *there was no invention in this last step*, but merely the exercise of the skill of the electrician or electrical engineer, because the taking of the first step by Tesla rendered the second step perfectly obvious to any one skilled in the art. But, notwithstanding the state of the prior art, and the “laboratory knowledge” of those skilled in it, *no one but Tesla took either of these steps which have added so much to the practical and useful knowledge of the electrical world.* [emphasis added].

Problems which vex the brain for many a weary hour and many a weary year become obvious to all the world, once they are solved; *but their obviousness after the fact does not necessarily prove their obviousness before the fact.*
Sirilla at 505, quoting *In re Pupin*, 299 F. 697, 701 (D.C. Cir. 1924)[emphasis added].

[I]n *Kelley v. Coe* [99 F. 2d 435, 437 (D.C. Cir. 1938)], the D.C. Circuit held the Commissioner of Patents in error for using hindsight in refusing to grant a patent... . The Commissioner had rejected the substitution as obvious. The court reversed, noting: “This is a splendid example of that type of reasoning which assumes, *because it is easy to follow a blazed trail, that it is also easy to make one.*”
Sirilla at 505 [emphasis added].

The test of obviousness ... must be applied as of the time of the invention and not retrospectively as of the time of the suit. *Higley v. Brenner*, 387 F.2d 855, 858 (D.C. Cir. 1967);

[O]bviousness, within the meaning of the statute, does not mean that one skilled in the art can perceive the solution after it has been found and pointed out by someone else, but the test is as of an earlier time, when the search is on for the solution to the problem. It should not be determined on the basis of subjective speculation as to what, after everything has been disclosed, might seem obvious.
Sirilla, 531-532, n. 450.

In comparing the differences between the prior art and the claims at issue:

It is improper ... to consider the *difference* as the *invention*. The ‘difference’ may have seemed slight (as has often been the case with some of history’s great inventions, e.g. the telephone), but it may have been the key to success and advancement in the art resulting from the invention ... Hence the statute, the law established not by judges but by Congress requires that the invention as claimed be considered ‘as a whole’ when

considering whether that invention would have been obvious when it was made. 35 U.S.C. § 103.
Jones v. Hardy, 727 F.2d 1524, 1528 (Fed.Cir. 1984)[emphasis added]; *Sirilla* at 573.

B. The *Graham v. John Deere* Test

The *Graham v. John Deere* test comes from a case of that name.¹ The “test” has been embodied in the AIPLA’s “GUIDE TO JURY INSTRUCTIONS IN PATENT CASES”, set out below.²

... In determining whether the defendant has established obviousness of the claimed subject matter the following steps should be taken by you:

1. Compare the scope and content of the prior art relied upon by defendant against the patent;
2. Identify the difference or differences between each claim of the patent and the prior art; and
3. Determine the level of ordinary skill in the pertinent art at the time the invention of the patent in suit was made.

... Before reaching a conclusion, you must also consider evidence submitted by the plaintiff to establish

- ▶ commercial success as a result of the invention,
- ▶ long felt but unresolved need filled by the invention,
- ▶ failure of others to solve the problem solved by the invention,
- ▶ acquiescence in the validity of the patent by others.

The factors announced in the *Graham v. John Deere* test will be considered in Section III.

There are two types of inquiries inherent in the Test: one centering on the evidence apparently to come from the Defendants (the three numbered items), the other centering on the

¹. 383 U.S. 1 (1966). The Supreme Court held the patent invalid, because the petitioner’s argument for patentability was based on a so-called “free-flex” theory” that was *not* found in the claims of the patent nor described in the patent as a significant feature of the invention. 383 U.S. at 25; *Sirilla* at 530 and 530, n. 433.

². Taken from *Sirilla* at 574, 575. Note the “bullets” are added for clarity; the words are accurately quoted, but are not set out in “bullets” in the original.

evidence to come from Plaintiff (the “bullet” items.) These are discussed in some detail in *Sirilla*. However, unhappily, there apparently is no recognized terminology to divide the two sets of items fairly. For example, the side who is “plaintiff” in a patent Application case (attempting to obtain a patent) could be either a plaintiff or defendant in a patent infringement action, depending on whether the action was for infringement or a declaratory action seeking to invalidate a patent. Accordingly, “Plaintiff” and “Defendant” evidence is not illustrative.

The first set of items were at one time called “primary” considerations, and the second set “secondary considerations”. At one time, courts announced that they would consider the “secondary considerations” only if there was doubt on the primary ones. *See, e.g. Paramount Publix*, 294 U.S. 464, 473-474 (1935); *Sirilla* at 475-477. With the passage of the Patent Act of 1952, and the new § 103a, the courts have held that a determination of obviousness must consider “all the record evidence ... regardless of whether any ‘doubt’ as to the patentability exists upon an examination of the prior art alone.” *See, e.g. in re Rouffet*, 149 F.3d 1350, 1355 (¶8) (Fed Cir. 1998) (“The secondary considerations are also essential components of the obviousness determination.”); *in re Khelghatian*, 364 F.2d 870, 872 (CCPA 1966); *Sirilla*, 530 - 531. This is consistent with the Jury Instructions cited above, which do not distinguish in levels of primacy between the two sets of considerations. Accordingly, to call one set of factors “primary” and another “secondary” would be misleading, since both must be given weight, presumably equal weight.³

C. Section 103a Is Recognized As Having Lowered The Bar to Patentability.

Sirilla explains that during the Great Depression, the Supreme Court was antagonistic to the patent system. He quotes Justice Jackson, who said that as a result of the Court’s “strong passion ... for striking [patents] down . . . the only patent that is valid is one which this Court has not been able to get its hands on.” *Sirilla* at 485, quoting *Otsby & Barton Co.*, 335 U.S. at 572.

Our political process during the Great Depression made what in retrospect have come to be viewed as counterproductive moves economically, including the Smoot-Hawley Tariff Act, that raised tariffs, reduced trade, and exacerbated the Great Depression. Following World War II, there were attempts to reverse those moves. One example is Bretton-Woods, which liberalized trade and established the international exchange system that fostered world trade. Another is the revision of the Patent Code in 1952, inserting the much more patent-friendly §103a. This is explained in detail by *Sirilla*.

The effect of that liberalization was discerned and explained most ably by Judge Learned Hand in *Lyon v. Bausch & Lomb Optical Co.*, 224 F.2d 530 (2nd Cir. 1955). *Sirilla* explained the issues:

The patent at issue involved a method for obtaining non-reflecting films of inorganic salts on the surface of lenses. The process involved two steps -- heating the lens in a vacuum to evaporate water and grease from the optical surface followed by

³. Perhaps the two sets of considerations could be subdivided into “Claims Analysis” and “Objective Indices of Non-Obviousness”. For the later terminology, *see, e.g. Rouffet, supra.*

vaporizing an inorganic salt in the vacuum for coating the optical surface *while keeping the optical surface heated*. The result was a superior, hardy, and tenacious and scratch-resistant coating on the lens. The only novelty, however, resided in keeping the optical surface heated while the coating was applied. A step that, in hindsight, might not seem very significant.

Sirilla at 518.

While the step, in hindsight, might seem insignificant, the District Court nevertheless upheld the patent. On appeal, Justice Hand concluded that the *Lyon* patent would fail the patentability test as it was applied just prior to the 1952 Act. *Sirilla* at 520, n. 376, quoting 224 F.2d at 536. Nevertheless, the Court of Appeals affirmed, Justice Hand explaining that it was up to the legislature to change the standard, and in this case the legislature had reduced the standard, making the patent in *Lyon* valid. *Id.*

Judge Hand bolstered his holding involving § 103 in *Reiner v. I. Leon Co.*, 285 F.2d 501 (2d Cir. 1960), explaining that the legislature had restored the old standard of patentability with § 103a, reversing “a slow drift of judicial decision that had been hostile to patents...”, and quoting the Justice Jackson’s observations from the dissent in *Otsby & Barton Co.*, cited above.⁴ Judge Hand went on to explain: “It is not for us to decide what ‘discoveries’ shall ‘promote the progress of science and the useful arts’ sufficiently to grant any ‘exclusive right’ of inventors (U.S. Constitution, Article 1, § 8). *Sirilla* at 521, quoting 285 F.2d at 503. Rather, that was up to the legislature.

D. The Federal Court of Appeals Has Been Antagonistic to the Patent Office’s Invalidating or Refusing to Grant or Patents Because of Claims of “Obviousness”.

The Federal Court of Appeals was established to provide some order to the Patent Process, and, in the absence of rulings from the Supreme Court, is the final arbiter of what is patentable.

A recent case is that of *in re Dembiczak*, 175 F.3d 994, No. 98-1498 (Fed. Cir. 1999). There, the Court reversed the Board of Patent Appeals and Interferences (herein “Board”), which had sustained rejections of the pending claims as obvious under 35 U.S.C. § 103(a) (Supp. 1998) and for obviousness-type double patenting. The invention at issue was a large trash bag made of orange plastic and decorated with lines and facial features, allowing the bag, when filled with trash or leaves, to resemble a Halloween-style pumpkin, or jack-o'-lantern. The Court explained:

All of the independent claims on appeal ... contain limitations that the bag must be “premanufactured orange in color,” have “facial indicia,” have openings suitable for filling with trash material, and that when filled, the bag must have a generally rounded

⁴. *Reinier* involved a patent for hair curlers, specifically clamps used to maintain formed curls in a woman’s hair. Considering the differences between the *Reiner* patent and the closest prior art, Hand commented that “[i]n such small and fragile devices slight divergences may be determinative.” *Sirilla* at 522, quoting 285 F.2d at 504.

appearance, like a pumpkin. Independent claims ... add the limitation that the bag's height must at least 36 inches, ... requires that the bag be made of a "weatherproof material," and ... requires that the bag be "waterproof."

(¶6)⁵ [Citation to claims omitted].

The prior art cited by the Board includes:

- (1) ... a book [by Holiday] ... describing how to teach children to make a "Crepe Paper Jack-O-Lantern" out of a strip of orange crepe paper, construction paper cut-outs in the shape of facial features, and "wadded newspapers" as filling;
- (2) ... a book [by Shapiro]... describing a method of making a "paper bag pumpkin" by stuffing a bag with newspapers, painting it orange, and then painting on facial features with black paint;
- (3) [a patent] describing a bag apparatus wherein the bag closure is accomplished by the use of folds or gussets in the bag material;
- (4) ... a design patent depicting a bag with a jack-o'-lantern face;
- (5) ... a design patent depicting a bag with a jack-o'-lantern face; and,
- (6) prior art "conventional" plastic lawn or trash bags ("the conventional trash bags").

(¶7);

The Board determined that, in its view of the prior art, "the only difference between the invention presently defined in the independent claims on appeal and the orange plastic trash bags of the prior art and the use of such bags resides in the application of the facial indicia to the outer surface of the bag." ... The Board further held that the missing facial indicia elements were provided by the Holiday and Shapiro references' description of painting jack-o'-lantern faces on paper bags. (¶8).

The Court reviewed "the ultimate determination of obviousness without deference to the Board..." (¶11). Holding that the PTO bears the burden of establishing a case of prima facie obviousness, the Court reversed the obviousness objections (¶17), and concluded that the Board had erred in refusing to grant the patent.

All the obviousness rejections affirmed by the Board resulted from a combination of prior art references, e.g., the conventional trash or yard bags, and the Holiday and Shapiro publications teaching the construction of decorated paper bags. ... To justify this combination, the Board simply stated that "the Holiday and Shapiro references would have suggested the application of . . . facial indicia to the prior art plastic trash bags." ...

(¶15)[Citations omitted].

⁵. The paragraph citations to the case law correspond to the new, non-proprietary system of case citation, avoiding the copyright claims of the West Publishing Company.

In also reversing the Board's finding of obviousness-type double patenting in light of the two design patents (§10), the Court held: "The position adopted by the Board - that a textual description of facial indicia found in the claims of the utility patent application makes obvious the specific designs claimed in the (patentably distinct) Dembiczak design patents - would presumably render obvious, or even anticipate, all design patents where a face was depicted on a bag. But this, of course, is not the law... . (§21)[Citations omitted, emphasis added].

In *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve*, 796 F.2d 443 (Fed. Cir. 1986), the Court reversed a finding of "obviousness" even though one of the patentees testified that the improvement was "obvious". The case involved laser-marked contact lenses. The prior art included means of marking lenses with ink or a sharp scribing or abrading tool.

The Court was unimpressed with one of patentee's testimony to the effect that the innovation was "obvious". (The patentee had no financial interest in the patent, and by then worked for a rival company which may have had an interest adverse to the patent.) The Court quoted with approval *Standard Oil Co. v. American Cyanamid Co.*, 774 F.2d 448, 454, 227 USPQ 293, 297-98 (Fed.Cir. 1985):

The issue of obviousness is determined entirely with reference to a *hypothetical* "person having ordinary skill in the art." It is only that hypothetical person who is presumed to be aware of all the pertinent art. The actual inventor's skill is irrelevant to this inquiry, and this is for a very important reason. The statutory emphasis is on a person of *ordinary* skill. Inventors, as a class, according to the concepts underlying the Constitution and the statutes that have created the patent system, possess something - call it what you will - which sets them apart from the workers of *ordinary* skill, and one should not go about determining obviousness under § 103 by inquiring into what *patentees* (i.e., inventors) would have known or would likely have done, faced with the revelation of references.
(§32)[Emphasis in original.]

In *in re Baker Hughes Incorporated*, ___ F.3d ___, No. 99-1463 (Fed. Cir. June 14, 2000), the Court reversed the decision of the Board, and held that the appealed claims would not have been obvious to one of ordinary skill in the art.

The patent claimed, *inter alia*, a process of inhibiting the liberation of hydrogen sulfide gas from petroleum products by adding a diaminomethane compound. (§3). The Board based its finding of obviousness, *inter alia*, on a previous patent, "Doerges".

Doerges taught "a process for removing hydrogen sulfide and other acid gases from natural gas (a gaseous hydrocarbon) by 'scrubbing' the natural gas with an absorbent liquid containing an organic solvent and an organic base such as a diaminomethane. ... (§10)[Citations omitted]. "[T]he Board found that the process disclosed in the Doerges reference resulted in 'a mixture containing a hydrocarbon gas, methanol, and a particular amount of the claimed diaminomethane compound . . . [T]he Doerges reference describes the composition recited in claim 17.' The Board held that "the complete description of the claimed composition is the ultimate of obviousness." (§12)[Citations omitted, emphases added].

The reader needs to understand that in both process, the diaminomethane preferentially absorbs the hydrogen sulfide gas. That is what the Board meant when it said that the chemical process of *Doegres* and *in re Baker* was the same.⁶ Nevertheless, the Court concluded that the process claimed in *in re Baker* was patentable over *Doegres*, because:

The Doerges reference teaches how to extract hydrogen sulfide from a gaseous hydrocarbon with a diaminomethane solution, whereas claim 1 teaches how to inhibit the liberation of hydrogen sulfide from a liquid hydrocarbon by adding diaminomethane directly. (§25)

The point of *in re Baker* is that small differences may be patentable over each other.

The point that small differences may be patentable is not new law. The Court in *in Kimberly-Clark Corp. v. Johnson & Johnson*, 745 F.2d 1437 (Fed. Cir. 1984), overruled a finding of invalidity of a patent for obviousness, holding: “The invention which we find non-obvious is, however, that which is specifically claimed in the patent in suit, a narrow invention in a crowded art. (§65) [emphasis added.]

Kimberly-Clark involved the patent for a sanitary napkin. At issue was the use of lines of adhesive. The prior art (“Champaigne”) had used one line of adhesive, and *Kimberly-Clark* had used two. The district court had focused on the one versus two lines of adhesive, and ruled the *Kimberly-Clark* patent invalid as obvious from Champaigne. The Court of Appeals reversed, holding that the *Kimberly-Clark* “adhesive had to serve the *dual* function of (1) wrapper penetration and sealing and (2) garment attachment, a concept totally lacking in Champaigne, or in any other prior art reference ...” (§65).

Note that the claim itself, cited and analyzed by the Court, did not claim an improvement for use of the dual function of the adhesive, but “*the improvement wherein* said adhesive comprises at least *two* narrow lines of adhesive...” [emphasis by the court.].⁷

⁶. In the case of *in re Baker*, the diaminomethane remained with the liquid petroleum product, while in *Doegres*, the liquid diaminomethane (with the absorbed hydrogen sulfide) was separated from the natural gas, thereby ridding the natural gas of a portion of the hydrogen sulfide gas. In both cases, the diaminomethane held the hydrogen sulfide, thereby reducing its release to the atmosphere.

⁷. The court determined that only Claim 1 need be analyzed for alleged obviousness. (§65) The Court set out Claim 1 as follows:

[Claim 1.] In an elongate sanitary napkin structure [13] provided with means for attaching said napkin to a supporting garment in which said means comprises pressure sensitive adhesive disposed on the bottom surface of said napkin [15, 16] and covered by a removable protective sheet [17], and said napkin comprises a pad of absorbent material enclosed in a fluid pervious non-woven wrapper [11] comprising a substantially rectangular sheet enveloping said pad and overlapped on the bottom side thereof [12 to 12a], *the improvement wherein* said adhesive

E. DUTY OF THE PATENT OFFICE AND SCOPE OF REVIEW BY THE COURT.

Before leaving the “law” section of this brief, we would cite other applicable law.

Obviousness is a question of law, which [the Court will] review *de novo*, ... The examiner bears the burden of establishing a *prima facie* case of obviousness. Only if this burden is met does the burden of coming forward with rebuttal argument or evidence shift to the applicant. When the references cited by the examiner fail to establish a *prima facie* case of obviousness, the rejection is improper and will be overturned.

In re Deuel, 51 F.3d 1552, No. 94-1202. (Fed. Cir. 1995) (¶19)[Citations omitted].

Similarly, in *in re Rouffet*, 149 F.3d 1350 (Fed Cir. 1998), the Court explained:⁸

To reject claims in an application under section 103, an examiner must show an un rebutted *prima facie* case of obviousness. [Citing *Deuel*]. In the absence of a proper *prima facie* case of obviousness, an applicant who complies with the other statutory requirements is entitled to a patent. On appeal to the Board, an applicant can overcome a rejection by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness. ... The secondary considerations are also essential components of the obviousness determination.

(¶6, 8) [Citations omitted].

As this court has stated, “virtually all [inventions] are combinations of old elements.” Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be “an illogical and inappropriate process by which to determine patentability.”

(¶18) [Citations omitted].

comprises at least *two* narrow lines of adhesive parallelly spaced from each other and extending longitudinally of said bottom surface [15, 16], said spaced lines being centrally disposed thereon with respect to the sides and ends thereof, and *said lines of adhesive penetrate both of said overlapped portions of said wrapper.*

(¶7) [Emphasis that of the Court of Appeals].

⁸. *Rouffet* involved reducing the number of “handovers” of signals from satellites. This is similar to the “handover” of signals from cellular phones as a car moves from cell to cell. While recognizing that the skill involved in the art was high, the Court criticized the Board’s reliance solely on the high level of skill in the art to reject the patent.

As noted above, the suggestion to combine requirement is a safeguard against the use of hindsight combinations to negate patentability. While the skill level is a component of the inquiry for a suggestion to combine, a lofty level of skill alone does not suffice to supply a motivation to combine. Otherwise a high level of ordinary skill in an art field would almost always preclude patentable inventions. As this court has often noted, invention itself is the process of combining prior art in a nonobvious manner. Therefore, even when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious.

(¶26) [Citations omitted, emphasis added].

III. DISCUSSION.

A. Applying the *Graham v. John Deere* Test.

The *Graham v. John Deere* Test, as embodied in the model jury instructions, is outlined in Section II.B.⁹ There are two types of inquiries, one centering on the claims themselves, and the others considering the environment or history of the time when the patent claims were made. For want of better terminology, the first set of considerations is called here “Claims Analysis” and the second “Objective Indices of Non-Obviousness”. Each will be considered in some detail.

1. Claims Analysis:

Roydsen (5,575,576) Does Not Teach, Claim, or Suggest What is Claimed Here.

Roydsen (U.S. Patent No. 5,575,576) entitled “Keyboard” is abstracted as follows:

A keyboard for the input of alphanumeric data. The keyboard consists of two or more sections which can be compacted for transport by placing portions of at least one section inside another section; the keyboard can be expanded for use to permit the keyboard to take on a size and spacing corresponding to that found in a keyboard for a conventional full sized typewriter or personal computer.

The existing patent (Roydsen) and the current Application are fundamentally two different inventions. There are at least four reasons why Roydsen does not teach or suggest what is claimed here.

⁹. **[Claims Analysis]** ...In determining...the...obviousness of the claimed subject matter...:

1. Compare the scope and content of the prior art ... ;
2. Identify the difference or differences between each claim of the patent and the prior art; and
3. Determine the level of ordinary skill in the pertinent art at the time the invention of the patent in suit was made.

[Objective Indices of Non-Obviousness] ... Before reaching a conclusion, you must also consider evidence submitted ... to establish

- ▶ commercial success as a result of the invention,
- ▶ long felt but unresolved need filled by the invention,
- ▶ failure of others to solve the problem solved by the invention,
- ▶ acquiescence in the validity of the patent by others.

a. Comparing the Scope and Content of the Prior Art:

Portions of a Keyboard are Interleaved Together in Roysden. Roysden teaches about placing the keys from one half of a keyboard between the keys of the other half of a keyboard. What was illustrated is the placing of rows of keys from one keyboard half between the rows of keys of another keyboard half. The focus was on keys--portions of one keyboard interleaved with portions of another keyboard. Nothing was suggested or illustrated but that portions of a keyboard could be folded into itself. Here, it is not portions of a keyboard interleaved with itself, but placement of the computer itself within the bowels of a keyboard.

Merely because Roysden teaches about “interleaving” does not mean that everything related to interleaving is somehow anticipated from Roysden. There are many components that are “interleaved”, but that does not mean that anything that is “interleaved” is somehow obvious from prior art. The zipper is, after all, the interleaving of components. The zipper was patented when--100 years ago? Does that mean that the process of interleaving components of any size, shape, or purpose, is somehow “obvious” from the zipper patent? We would respectfully suggest not.¹⁰

b. Identifying the Difference or Differences Between Each Claim of the Patent and the Prior Art;

i. Roysden Fundamentally Requires Two Keyboard Sections; The Current Application Does Not. Roysden fundamentally required at least two keyboard sections. The teachings in the current Application works perfectly well with a monolithic keyboard.

ii. Movement of the Interleaved Components is Inherent in Roysden; No Movement is Required in the Current Application. Roysden teaches about the movement of interleaved components relative to one another. In Roysden, there are two positions, an interleaved (non-functional) position and a non-interleaved (functional) position. What is claimed in Roysden necessarily requires the movement of the components relative to one another. In the present Application, there need not be any relative movement between the computer components and the keys. Further, Roysden teaches how to make something that changes size -- small for transport and large for use. The teachings in the current Application do not require a change in size.¹¹

¹⁰. Consider *Dembiczak*, analyzed in Section II.D., above. There, the Court of Appeals rejected the notion that a design patent which depicted a face on a bag “would presumably render obvious or even anticipate all design patents where a face was depicted on a bag. [The Court concluded:] But this, of course, is not the law.” *Dembiczak, supra*, (¶21).

¹¹. That does not mean that movement or a change in size is not permitted, merely that movement is not required to use the teachings in the current Application. For example, it would be possible to combine the teachings here with the teachings in Roysden. But it is frequently possible to combine the teachings of several patent applications. Indeed, it would probably be impossible to build a modern palmtop computer without using the teachings of several issued patents. But that does not mean that an improvement, properly claimed, could not be made.

**iii. Roysden Teaches How to Reduce the Size of the Keyboard for Transport;
This Application Teaches How to Reduce the Size of the Computer.**

Roysden teaches that the keyboard can be reduced in size¹² at least for purposes of transport. Indeed, inherent in Roysden is the realization that the keyboard is not reduced in size relative to other keyboards when the Roysden keyboard is in its operational position. In contrast, the current application does not require or claim a change in size of the computer and keyboard between their storage positions and their operational position. (But see footnote 11, *supra*).

Too, the only change in size of the computer and keyboard in Roysden is the change in size of the keyboard for transport. The size of the computer itself is unaffected. In the current application, the combination of the computer and keyboard is smaller than each component separately. While both Roysden and the current application provide for a smaller computer and keyboard combination (at least for transport), plainly any method that reduces the overall size of the computer is not barred as “obvious” from Roysden.

iv. One purpose of the Application is to Provide Cooling;

There is No Intent to Provide Additional Cooling in Roysden. One fundamental purpose of Roysden is different from the fundamental purpose of the current Application. Computer chips can be made exceedingly small in volume. In a modern portable computer, “chips” (e.g. microprocessor, support functions, memory, and the like) could be reduced in size to less than 1/2 inch cube--physically not much larger than a sugar cube. The technology exists today. However, packing the computer chips that close together would create unacceptable heat problems. What the current Application teaches, *inter alia*, is the ability to spread out the computer chips, so that heat is dissipated more readily. See Disclosure, page 9 (“In addition to saving space, Interleaving Computer Components within a keyboard aids in the dissipation of heat caused by said Computer Components.”)¹³

¹². See, e.g. Roysden, page 6:

In summary, it would be highly desirable to provide a keyboard which would, for transit or storage, occupy an area smaller than that of a conventional full sized keyboard, and which would, in use, be expandable to provide a 101-key keyboard with inter-key spacings corresponding to key spacings found on keyboards for full sized PC's. Alternatively, it would be highly desirable to provide small computers with a keyboard that would permit conventional touch-typing, such as is that found on the 84 key laptop keyboard of today, but having a largest dimension during transport substantially smaller than the current crop of laptops.

¹³. The patent law recognizes that patents were there are new or “unexpected results”. Thus, the Court granted a patent in *Baker Hughes* for a process which “inhibit[ed] the liberation of hydrogen sulfide from a liquid hydrocarbon”, even though the same chemistry had been taught in an earlier patent, because the earlier patent taught how to “extract hydrogen sulfide from a gaseous hydrocarbon.” See Section II.D., *supra*. Similarly, the Court upheld a patent in *Kimberly-Clark*, where the adhesive bands served a duly purpose, even though there was no claim of improvement for this dual purpose.

2. **Objective Indices of Non-Obviousness:**

3.

There are four criteria listed under the “Objective Indices of Non-Obviousness” portion of the *Graham* test. Two are applicable normally only to patent infringement cases, where the invention has been patented and marketed--commercial success and licensing by others. Plainly, the commercial success of the patented product would not normally apply to a patent application, since an individual in my position frequently cannot afford to disclose to the commercial world the teachings of the patent without a patent in hand (or at least the patent process further along.) Accordingly, “commercial success” is not applicable here. For the same reason, “acquiescence in the validity of the patent by others”--basically licensing of the intellectual property by others--is not applicable here.

Accordingly, we move on to the other two criteria: “long-felt but unresolved need filled by the invention”, and “failure of others to solve the problem solved by the invention.” See, e.g. *Lyon*, 224 F.2d at 535; *Reiner*, 285 F.2d at 503; *Brown v. Brock*, 240 F.2d 723, 727 (4th Cir. 1957) (“the record ... shows a long felt and unsatisfied want for an acceptable weeping doll. ... If any solution to the problem had been obvious, it would not have been overlooked in the industry for want of desire or effort.”)

a. There Has Been a “Long-Felt Need” for the Invention Here.

In the present case, it should be uncontested that there has been a long-felt need to marry a usable keyboard to a small computer, but maintain a small package. Small computers have been known for some time, but the data entry problems limit the usefulness of those computers.

b. Failure of Others To solve the Problem Solved By The Invention.

There is at least one small, compactible keyboard on the market that works with a small computer (“Personal Digital Assistant” or PDA). See Appendix A. However, the keyboard itself, even when compacted, is as large as the P.D.A.

The current Application teaches how all of the computer except maybe the display can be fitted inside the keyboard, thereby reducing the total package by approximately 1/3. Roysden has been in public domain for nearly three years; the foldable keyboard has come to market within that time, but it was apparently not “obvious” to the designers of that foldable keyboard that a further reduction in size of the package is possible.

Similarly, there exists computers that are incorporated with a keyboard in one unit. See, e.g. Appendix B. However, the components are placed below the keys, rather than interleaved with the keys, as is claimed here.

The problem, of course, is that keyboard designers are not computer designers, and computer designers are not keyboard designers.

I would respectfully urge that interleaving a computer within the confines of a keyboard is not “obvious” from Roysden, except possibly in retrospect, and that the current Application should be granted.

B. Things Often Become Obvious Only in Hindsight.

It is well settled in the law that a patent may not be barred merely because it is “obvious” in hindsight. *See* Section II, above. But the Patent Examiner was not afforded the opportunity of determining whether the teachings of the current Application was obvious beforehand. He was presented with the puzzle and the solution at the same time. He claims that it was “obvious”. However, I respectfully suggest that what is obvious in hindsight was not necessarily obvious beforehand. Court cases involving upholding the patentability of certain inventions have been presented earlier. At this stage, I turn to some historical and literary examples to illustrate the point that what is obvious in hindsight is not necessarily obvious beforehand.

1. Discovering the Obvious: Examples in Science.

That things often become obvious only in hindsight is illustrated in *The Making of the Atomic Bomb* by Richard Rhodes (Simon and Schuster, Touchstone Edition 1988). Rhodes tells several stories involving Irène Curie, the daughter of Pierre and Marie Curie, and her husband, Joliot.

a. The Discovery of the Neutron.

The first involves the discovery of the neutron. Physicists in the late 1920's and early 1930's were investigating the effect of radiation on beryllium. In 1929, the Joliot-Curies started to work in collaboration in the Curie laboratory, and in early 1932 reported their results in the French physics journal, *Comptes Rendus*.

The Joliot-Curies bombarded beryllium with alpha particles and found that the radiation coming from the irradiated beryllium contained three times the energy of the irradiating alpha particles. This “beryllium radiation”, when used to irradiate materials containing hydrogen (e.g. paraffin), produced protons. Since the radiation from beryllium exhibited no charge, the Joliot-Curies concluded that the “beryllium radiation” was gamma rays and published their conclusions.

At Cavendish Laboratory at Cambridge University, Chadwick and Rutherford read the Joliot-Curie paper “with growing amazement... . Rutherford agreed that one must believe the observations; the explanation was quite another matter.” *Id* at 162. To Chadwick, the Joliot-Curie explanation (that gamma radiation would eject protons) “was as unlikely as if a marble should deflect a wrecking ball.” *Id* at 162. Instead, Chadwick later wrote, “in what in fact is a devastating criticism of the Joliot-Curie thesis, invoking the basic physical rule that no more energy or momentum can come out of an event than went into it: ‘It is evident that we must either relinquish the application of the conservation of energy and momentum in these collisions or adopt another hypothesis about the nature of the radiation.’ When they read that sentence the Joliot-Curies were deeply and properly chagrined.” *Id*, page 164.

What was “obvious” to Chadwick, and seemingly should have been obvious to any respectable physicist who understands the basic laws of science (the conservation of energy and momentum), was that the radiation coming from alpha-irradiated beryllium was not gamma rays, but particles of a weight comparable to that of a proton, but without the proton’s electrical charge. In other words, Chadwick explained that this was experimental evidence of the

“neutron”.¹⁴ It was “obvious”, but obvious only in retrospect. Chadwick won the Nobel Prize for that recognition.

Should Chadwick not have won the Nobel Prize for discovering what, from the literature, should have been “obvious”? No one has seriously suggested that.

Merely because, in retrospect, something was “obvious” does not make it obvious prior to the time of the discovery.

b. Obviousness: The Discovery of the Positron from Cloud-Chamber Photographs.

The second story also concerns the Joliot-Curies, and took place the same year.

On August 2, 1932, working with a carefully prepared cloud chamber, an American experimentalist at Caltech named Carl Anderson had discovered a new particle in a shower of cosmic rays. The particle was an electron with a positive instead of a negative charge, a “positron”, the first indication that the universe consists not only of matter but of antimatter as well. (This discovery earned Anderson the 1936 Nobel Prize.) Physicists everywhere immediately looked through their files of cloud-chamber photographs and identified position tracks they had misidentified before. (*The Joliot-Curies, who had missed the neutron, saw that they had also missed the positron*).

Id at 200 [emphasis supplied].

c. The Joliot-Curies Were “Skilled in the Art”.

Now, one could suppose that the Joliot-Curies were not gifted with sufficient insight and skills in observation to perform work in their chosen field. In other words, one could propose that the Joliot-Curies could not recognize the obvious, that they were not “skilled in the art”, to use the terminology of the Patent Office. That would be a false supposition, as will be explained.

The Joliot-Curies continued their experiments in late 1932 and early 1933.

It seemed likely that the appearance of neutrons and positrons rather than protons might depend on the energy of the alpha particles attacking the target. The Joliot-Curies could test that possibility by moving their polonium source away from the target, slowing the alphas by forcing them to batter their way through longer ranges of air. Joliot went to work. Without question he was seeing neutrons. When he shifted the polonium away from the aluminum-foil target “the emission of neutrons [ceased] altogether when a minimum velocity [was] reached.” But something else happened then to surprise him. After neutron emission ceased, positron emission

¹⁴. Rutherford had proposed in 1920 that a neutral particle comparable in mass to the proton may exist, and named the proposed particle a “neutron”. However, there was no experimental evidence of the particle until the events recited above.

continued -- not stopping abruptly but decreasing “only over a period of time, like the radiation ... from a naturally radioactive element.” What was going on?
Id at 200-201.

The Joliot-Curies had “discovered how to make matter radioactive by artificial means”, for which they were awarded the Nobel Prize in Physics in 1935. They could transmute the elements -- the scientific equivalent of the philosopher’s stone (which, according to legend, could convert lead to gold). The scope of the discovery can be measured in two ways. First, they were awarded the Nobel Prize in only 2 years (many have had to wait a decade or more; for example, Einstein was awarded his in 1921 for his paper on explaining the Photoelectric Effect in 1905.) Second, Emilio Sergrè, a later Nobel Laureate himself, called it “one of the most important discoveries of the century”. *Id* at 202. It led the way to the Atomic Bomb (which is why it is recorded in the book, *The Making of the Atomic Bomb*).

What can we learn from this? The neutron was “obvious”, in retrospect, from the Joliot-Curie’s work. But it was not obvious to them at the time, and the Nobel Prize was won by the person who recognized the implications.

Second, the positron was “obvious” from the cloud-camber photographs. But it was not “obvious” prior to Anderson pointing it out, and Anderson, who first recognized the tracks for what they were, also won the Nobel Prize.

Third, the Joliot-Curies were certainly “skilled in the art”, as proven by their extraordinary discovery and the almost unprecedentedly quick recognition with the Nobel Prize. What is “obvious” in retrospect is not “obvious” to the observer, even the very trained and very talented observer looking for new phenomena -- looking for “inventions”.

The mathematics of the description will be discussed in a moment. However, there is another category of “obviousness”, or the lack thereof, that needs to be discussed.

C. Discovering the Obvious: Examples in Literature.

There are two stories in literature, one fiction and one true, which illustrate the point that what is “obvious” in retrospect may not be obvious to those diligently searching for it.

1. The Purloined Letter.

In Edgar Allen Poe’s *The Purloined Letter*, the story centers around searching a house very thoroughly for many days for a stolen letter, when in fact it was “hidden” in open view--sitting on the fireplace mantle in full view of everyone in the room. The “obvious” had been overlooked by all.

2. The Cat in *Midnight in the Garden of Good and Evil*”.

There is a famous book (and a movie) called *Midnight in the Garden of Good and Evil*, by John Berendt, Random House, New York 1994. This was based upon a real-life set of events. Basically, Jim Williams was charged with murdering Danny Hansforth. Williams admitted that he had shot Hansforth, but claimed it was in self-defense after Hansforth shot at him. Hansforth was found with a pistol in his hand; the pistol had been discharged. However, Hansforth’s hands contained no powder residues, as would normally be the case when a person discharged a gun. The gun was a Luger, which, because of its tight construction, would create much less residue than a normal revolver, but there should have been some.¹⁵ Williams was very wealthy, and could afford a competent and vigorous defense. There were four trials; the first two returned unanimous guilty verdicts, but they were reversed on appeal.¹⁶ At the third trial, defense counsel discovered that the victim’s hands had not been “bagged” at the scene (plastic bags taped over the hands to preserve the evidence of gunpowder residue.) Presumably the powder could have been brushed off in the handling of the body (the reason for bagging the hands in the first place.) Only one juror was convinced. There was an 11-1 vote for conviction--a hung jury.

The defense was thoroughly prepared by competent counsel.¹⁷ One measure of the amount of preparation is that seven hundred and fifty thousand dollars had been spent on the first three trials. *Id* at 341, 343, 366. Presumably every conceivable fact had been found and analyzed. But had it?

Before the fourth trial, a former juror called up the defense counsel asked him about the “cat” in the picture. “What cat?” asked Mr. Seiler. “Well, the cat in the picture of the crime scene.”

It turns out that there was a calico cat on the Oriental rug in one of the photographs of the murder scene entered into evidence. Defense counsel preparing for and sitting through several lengthy trials had not seen the cat. Appendix C.¹⁸ When you tell someone, “Do you see the cat?”

¹⁵. *Id* at 345, 348. Plainly, if there were only a little powder present, it is much more likely that the powder could be removed prior to the tests.

¹⁶. In the movie, apparently for literary reasons, there is only one trial. I say this because the reader may have seen the move, but not read the book, and may not understand the events described herein.

¹⁷. “At fifty, Sonny Seiler enjoyed a position of considerable stature within the Georgia legal community. He was past president of the State Bar of Georgia. He was listed in the book *The Best Lawyers in America* as one of the top civil litigators in the country.” *Id* at 266.

¹⁸. A photocopy of the photograph was graciously provided by Mr. Seiler, and is set out in Appendix C. The cat, and the importance of the cat, was not set out in the book, which was not written by Mr. Seiler, but was related by Mr. Seiler in a talk to The Law Practice Management Section and Law Office Administrators, State Bar of Arizona, 1999. The photograph was a centerpiece of his explanation of the trial during that talk.

the cat is obvious. However, it was not obvious to defense counsel, in spite of a tremendous amount of preparation.

The importance of the cat? Well, a cat at the murder scene could have (1) brushed up against the hand, removing the powder, or (2) licked the hand, removing the powder. Keep in mind that, because the weapon was a Luger, very little powder residue was expected. The cat created an inference of “reasonable doubt”.

The first three trials resulted in 35 out of 36 votes for conviction. The fourth trial was 12 to 0 for acquittal. Was the difference in result solely because of the cat? Who knows. But certainly it would have been argued in the first three trials if defense counsel had seen the cat.

The computer integrated into the bowels of the keyboard might be like that cat -- “obvious” in retrospect, but not obvious beforehand.

D. Merely Because The Same Mathematical Description Was Used Does Not Make the Current Application “Obvious” From Roysden.

One of the implied criticisms is that I used the same mathematics to describe the computer parts integrated into the keyboard as I used to describe a keyboard half which merges into another keyboard half.

First, the mathematics itself was seriously resisted by the Patent Office in the original application of Roysden. However, as a fairly experienced trial attorney, I could not divine how I could describe how two keyboards could be integrated or “interleaved” one within the other without using some form of mathematical expression. The original draft used common words like “interleave” and the like--words later requested by the Patent Examiner during informal telephone discussions. However, as an experienced trial attorney, I was concerned that an “expert” could come in and claim (falsely, but with damaging effect nevertheless) that the word “interleaved” means something different than the way his client had chosen to get around the Patent. After considerable thought and discussion with others, I decided that I needed a mathematical description, and topology seemed to be the math of choice.

When it came time to file the current patent, it seemed natural to use the same description method. However, merely because the same mathematical description method was used does not mean that the underlying invention somehow “obvious”.¹⁹

The historical analogy I provide comes from *The Feynman Processor*” by Gerald J. Milburn Perseus Books, Reading, Massachusetts (1998). The book explains that “probability amplitudes” are related to the branch of physics known as Quantum Electrodynamics. The methods of calculation were discovered in 1948 by three men working independently, Julian Schwinger, Sin-Itiro Tomonaga, and Feynman, for which they were awarded the Nobel Prize.

¹⁹. Keep in mind that the same chemical process was used in *Baker-Hughes* that had been used in another process, but that did not prevent the Court of Appeals declaring the process patentable. See e.g. pages 8-9, *supra*.

Given a probability amplitude, how do we calculate a probability? A probability amplitude depends on two real numbers. Given these numbers we get the probability by squaring each them and adding. Now that may sound familiar. What else depends on the sum of the squares of two numbers? Yes, Pythagoras' theorem, which tells us how to calculate the length of the hypotenuse of a right angle triangle from the length of the other two sides. What a surprise! The world is irreducibly random and the odds turn out to be determined by a formula discovered by an ancient Greek sage over two millennia ago.

Id. at 15 [emphasis added].

Plainly, Pythagoras, in the 6th century B.C., was not teaching how to calculate probability amplitudes for quantum electrodynamics. The mathematics is the same, but Pythagoras was teaching how to calculate the hypotenuse of a right triangle, while Feynman was teaching how to calculate the probability that light would interact with electrons. Feynman should not be denied his Nobel Prize for his work being "obvious" from Pythagoras, any more than Chadwick and Anderson should be denied theirs as being "obvious" from the work of Joliot-Curie.

In Roysden, I taught how to interleave two keyboard halves; in the present case, I am teaching how to integrate a computer within a keyboard. Those are fundamentally two different things; one is "obvious" from the other, if at all, only in retrospect. One does not suggest the other.

E. Economic Incentives Are Embodied in the Patent System, for the Good of the Nation:

Mr. Sirilla explained that the standard of non-obviousness was a low one. In discussing the Patent and Trademark Office's 1994 Public Hearing on §103, he notes that there was only one opponent who argued for a

stricter, pre-Federal Circuit standard of non-obviousness. ... [H]e wanted the Patent Office to ignore § 103 and return to a strict "ingenious invention" standard, contending that "[t]oday's lowered standard of non-obviousness erases the difference between an ingenious invention and a routine one." Not surprisingly, his suggestion fell on deaf ears.

Sirilla at 553.

Why should the standard for non-obviousness be a low one? Because the patent process gives an economic incentive to people like me to devote time, resources, and ingenuity to discover solutions to problems that vex the commercial world. But for the protection that patents afford, I and thousands of other inventors like me would have no incentive to make discoveries or, once having made them, communicate those discoveries to the world. Mr. Sirilla cites with approval Abraham Lincoln's timeless observation about our patent system: "The Patent System added the Fuel of Interest to the Fire of Genius." *Sirilla* at 557.²⁰

²⁰. "The quote from Abraham Lincoln may be found engraved over the northwest entrance to the U.S. Department of Commerce at 15th and "E" Streets, N.W., Washington, D.C., which housed the Patent Office for many years." *Id.* n. 615.

Mr. Sirilla goes on to cite with approval the special NEWSWEEK issue: *2000, a New Millennium, the Power of Invention*. NEWSWEEK, Winter 1997-98.

The issue concludes with the profound observations that this country nourishes “a climate that consistently encourages the new, the practical and the useful”; and that “[i]nnovation is a spirit; it subsists on trial and error. It would be odd--indeed a contradiction--if anyone found a once-and-for-all way to do it.” [NEWSWEEK at 79]. *Sirilla* at 557, n. 615.

Finally, in *Patchwork of Old and New*, in FORBES ASAP, November 30, 1998, pages 201, ff, columnist and author Virginia Postrel discusses the incremental nature of invention and improvement.

“The vast number of things that exist in the world today ensures that there will be ever more tomorrow, for virtually every existing thing is fair game to come under the scrutiny of someone restless and discontented who does not think ‘well enough’ is sufficiently free of faults,” writes civil engineering professor Henry Petroski.

We look for ways to improve what already exists. This modest maxim is a stark contrast to the starting-from-scratch dictates of “form follows function.” But it can produce powerful results: Witness the Mount Wilson telescope. This incremental idea of progress acknowledges that life will never be perfect, *that any improvement requires ingenuity and work ...*

By their very nature, inventors take advantage of what already exists, an opportunity that increases over time. The more ideas and inventions we have available to combine, the more creative we can be. ...

[I]n fact progress is incremental and unpredictable -- a process whose cumulative effects are worth celebrating Progress ... is ... the sum of countless parallel individual searches, each aimed at greater knowledge or happiness. *Id* at 203, 204.

Pre-Columbian America did not have the wheel. Actually, they had large round objects with holes in them--but they were not mounted on axles and used for transportation. They were “calendars”. They even had small toys with wheels. But perhaps the greatest invention of mankind--the wheel--was missing from their technology. You cannot look at any Mexican museum without seeing “wheels”. But they were not used as wheels. You could say, in retrospect, that the “wheel” was obvious. But the most important invention of mindkind was not “obvious” to the native American.

It is the individual inventors who have done so much to change the course of history. It was not the Hewlett Packards of the 1970's, who turned down a chance to develop the “Apple” computer, or the IBM's of the 1980's, which thought the total, world-wide demand for personal computers would be 250,000. The Palm Pilot came from a small group of individuals, not a corporate conglomerate. Today, with the growth of the Internet, innovators are attempting to find

ways to take our internet appliance with us. It is respectfully suggested that this Application is one small step towards that future. But if the Patent Office turns down this Application, there is little or no incentive for anybody to invest the resources to turn it into reality.

F. The Patents Cited by the Examiner Are Not Applicable.

In an attempt to be complete, I observe that the Examiner stated as follows:

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The applicant's attention is invited to the patent Allison et al. (US patent #5,943,041) and Robinson et al. (US patent #5,941,648).

The patents were not provided with the action letter, and no explanation is made how said patents are applicable. Rather than spend several hours analyzing those patents here, and extending this brief, we agree that the Patent Office not only did not rely upon said patents, but had no basis to do so.

IV. CONCLUSION.

I respectfully suggest that it is not "obvious" from Roysden, except in retrospect, that some or all of a computer can be placed within the bowels of a keyboard.

Roysden taught about keyboards, not about computers. The keyboard in Roysden was to be used *with* a computer; there is no suggestion within Roysden that the computer could be placed *inside* the keyboard. Attention is focused in Roysden on keys; it is not obvious (except perhaps in retrospect) that the entire computer could be housed within the confines of the keyboard.

Similarly, while in retrospect it may be "obvious" that portions of the computer can be placed within a keyboard, it was not obvious to the undersigned, in spite of looking at keyboards, including prototypes of the keyboard ultimately patented (Roysden) for thousands of hours over an approximately 8 year period of the patent process.²¹ The Patent has been issued nearly three years now; there is a great push to make computers smaller, and to incorporate keyboards with these small computers. (For example, the recently-introduced folding keyboard for the Palm Pilot and other palmtop computers. See Appendix A.) But no one, with the exception of myself, recognized that the computer itself could be placed within the keyboard, and I didn't recognize it at the time, but only after further, considerable study.

There are several reasons for that, but primarily the original Patent taught about a "Keyboard". That was its title, and what it described. Roysden was an attempt to show how a keyboard could be folded into itself, or two keyboard halves could be placed within themselves. The keyboard was a separate entity, essentially to be attached to a computer. I was focused on

²¹. The process that led up to the grant of the Roysden patent, including its predecessor patent applications, appeals, and the like, should be on file at the Patent Office.

the keyboard, and the Patent was focused on the keyboard.²² The present invention involves the integration of a computer and a keyboard. While one could claim, in retrospect, that it should be “obvious”, in fact there is nothing within the original Roysden (5,575,576) disclosure to suggest or alert one to the possibility that a computer could be integrated within a keyboard. It was not “obvious” from the original Roysden, and the current Application should not be denied on alleged grounds that it was “obvious”. That would be a *post hoc* obviousness--not the standard in the patent office. Most patents are “obvious” in retrospect. It was the seeing what in retrospect was obvious that won Chadwick and Anderson their Nobel Prizes. It is because most discoveries are “obvious” in retrospect that the Patent Office must not consider what is “obvious” in retrospect.

In the Pumpkin bag case (*Dembiczak*), any person *could* have combined the trash bag with the children’s books on making pumpkins, but it was the inventor who actually did. The Patent Office refused to grant the patent; the Court of Appeals reversed and awarded the patent.

Fundamentally, the “scope and content” of the integration of parts in Roysden is different than that of this Application.²³ Further, there is a substantial “difference or differences between” the Application and Roysden. In Roysden, there must of necessity be at least two keyboard sections. In the current Application, the keyboard can be monolithic (one section). The integrated parts necessarily move relative to one another in Roysden from a storage position to a use position; there is no movement or change in size necessary in the current Application. Finally, one benefit of the current Application is that it promotes cooling of computer components; no cooling is inherent (or necessary) in Roysden.

As is demonstrated by the stream of new products being introduced today, there has been a “long-felt but unresolved need” for making smaller computers, and there has been demonstrated “failure of others to solve the problem solved by the invention.” Roysden has been in the public domain for almost three (3) years -- a long time in the fast-paced internet world. In spite of the existence of the teachings of Roysden, nobody has placed the computer inside of the computer. Instead, the current commercial application is to attach a compactable keyboard to a computer -- which is what is contemplated by Roysden. But the current Application promises more -- a 1/3 reduction in the size of the integrated computer/keyboard. This is a significant improvement over contemporary designs.

²². Patent law is intended to encourage discoveries. It does not help that a discovery “could” have been made; only discoveries that are actually made have the opportunity to benefit society, and it is the benefit to society that the Patent Laws were designed to encourage. If the mental processes fail to make the discovery, society is denied the benefits of the discovery. Time is critical. Discoveries become obsolete as we move forward. If I had not made my Application, the discovery disclosed in the Application could have remained undiscovered until its usefulness was made obsolete by the march of progress. That may true not only of the current Application, but of any application that is wrongfully denied.

²³. From the *Graham v. John Deere* test; see section II.B., *supra*.

This Application is an additional step along the way -- an important step. The "obvious" in retrospect is not the "obvious" *a priori*, and it is undisputed that one cannot use hindsight to determine what is "obvious" to deny a patent application..

For all of the foregoing reasons, the current Application should be allowed.

APPENDICES.

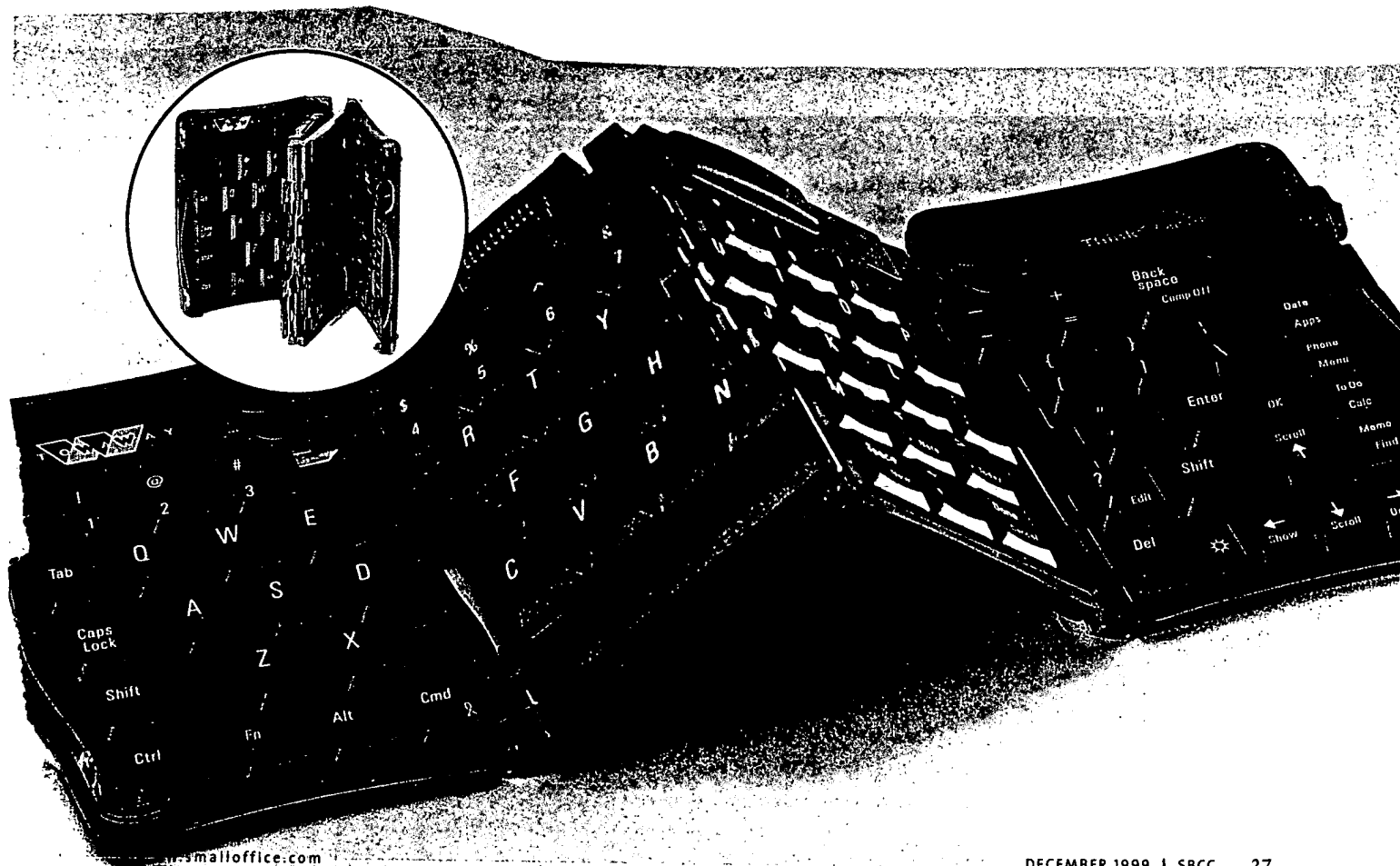
- A. Advertisement for folding keyboard and PDA.
- B. Advertisement for "Zero-Footprint-PC"
- C. Photograph of cat on couch.
- D. Editorial, "Handhelds Finally Catching up to the Hype.

KEYBOARD ORIGAMI

If your computer can fit in the palm of your hand, why shouldn't your keyboard do the same? That's the philosophy behind Think Outside's foldable keyboard, the Stowaway. Designed for use with 3Com's Palm series of handheld PCs, the Stowaway's roomy full-size keyboard makes it easier to write e-mails, take notes, and enter contact information. It folds up into a compact package that can fit in your pocket, and docks with any Palm device. A keyboard for Windows CE devices is also in the works.

Think Outside; 858-793-2900

www.thinkoutside.com; \$100

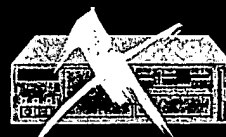


THIN CLIENT PC JUST GOT THINNER!

"Zero-Footprint-PC"

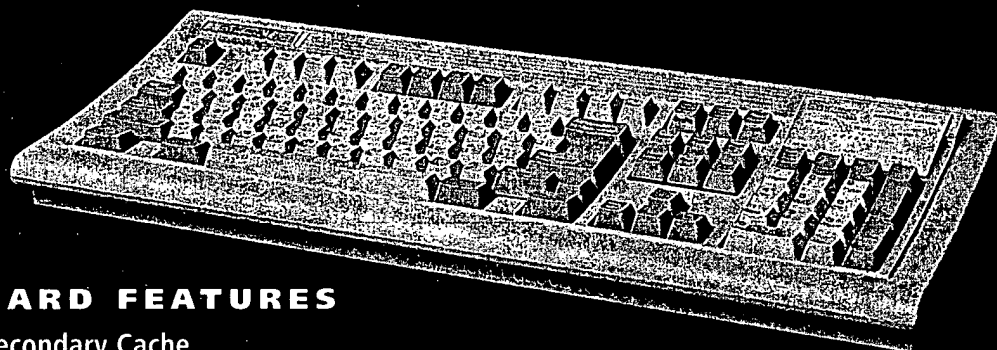
No matter how small the box, why have one at all?

Cybernet Manufacturing has eliminated the need of having any kind of PC box by integrating a complete Pentium Class PC inside a standard size keyboard.



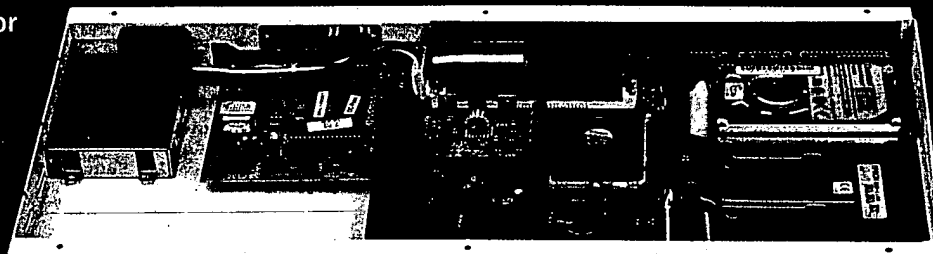
The Zero-Footprint-PC is the answer to all your space constraint problems. Break the habit and take the next step in Personal Computing. To experience this space-saving technology and to free-up valuable work space, contact Cybernet Manufacturing today.

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STANDARD FEATURES

- 512K Secondary Cache
- On-Board PCI-BUS 10MBPS Ethernet with RJ-45 Connector
- On-Board PCI-BUS SVGA with 2MB
- 1.44MB Floppy Disk Drive
- 2 E-Serial, 1 E-Parallel and 1 PS/2 port
- 16-Bit ISA Expansion Slot
- USB Port
- Infrared Port
- Warranty: Two Year Parts & Labor



OPEN VIEW

OPTIONAL FEATURES

- CPU Options: Intel 166MMX, 200MMX, 233MMX
- Memory Options: 32MB, 64MB, 128MB
- 2.5" Hard Drive Options: 1.2GB, 3.2GB, 4.0GB, 5.0GB, 6.4GB



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ROB O'REGAN: THIS EEEK

HANDHELDS FINALLY CATCHING UP TO THE HYPE

WHILE PALMPILOT INVENTOR AND HANDSPRING CHAIRMAN Jeff Hawkins talked about conventional thinking vs. unconventional wisdom during a speech at PC Expo last week, I glanced to my right to see a gentleman taking notes by typing on a full-size, foldable keyboard—attached to his Palm. At a press conference later in the day, a reporter was transcribing the comments of Palm executives directly into his handheld unit using a stylus. I glanced down at my dog-eared reporter's notebook and thought, What am I missing?

The answer: a revolution in the making.

If there were any questions about handheld devices in general, and the Palm in particular, assuming a place as legitimate corporate computing devices, they were answered at PC Expo.

For this latest segment in the digital revolution, all the pieces are falling into place, some more quickly than others. The devices themselves are evolving rapidly (see story, Page 11). Palm, finally understanding that expandability is important, pledged a new family of devices next year that includes a Secure Card slot for adding memory, wireless or other capabilities.

At the same time, both Hawkins and Palm Chief Operating Officer Alan Kessler emphasize the need for simplicity. Both execs said it's better to focus on implementing a few key features the right way than to take a kitchen-sink approach to functionality.

Hawkins, for example, is skeptical of technology such as Sun's Jini that makes handheld gadgets a bit too intelligent. When devices start doing things on their own, he reasoned, folks get nervous. "What people really want is predictable behavior," he said.

If that's the case, then the unpredictability of the wireless infrastructure will remain the primary barrier

to the growth of the handheld industry. Whether the issue is security, as Carmien Nobel and Scott Berinato probe in our Page 1 story, or things like latency and persistent connections, seamless wireless access still poses the greatest

challenge for service providers, content developers and device makers.

Palm also faces the delicate issue of being both the overseer of the platform and a competitor to all Palm OS licensees. Palm execs rightfully acknowledge that new Palm units from the likes of Handspring and Sony help legitimize the market, but we'll see how those execs react once licensees start eating into Palm's hardware sales.

The best thing about the handheld revolution is that users no longer

have to conform to the one-size-fits-all approach long espoused by the PC industry. If you want a device that com-

bines a smart phone with a PDA, you'll be able to buy it. If you want both a miniaturized cell phone and a handheld Net access device, you can do that as well.

After lugging a succession of hefty notebook PCs around for several years, I'm ready to lighten my load. The technology seems ready, finally, to help me do that. ☺

PALM FINALLY UNDERSTANDS EXPANDABILITY IS IMPORTANT.

The Buzz

SERVERS

Big Blue's Big Bang

COULD A COMPUTER SAVE the world from nuclear annihilation?

One computer that will give it a try is IBM's ASCI White supercomputer, which was rolled out last week. The Department of Energy will use the super-server to simulate nuclear weapons tests.

The department's goal is to test the entire U.S. nuclear stockpile through simulation rather than actual explosion of the weapons.

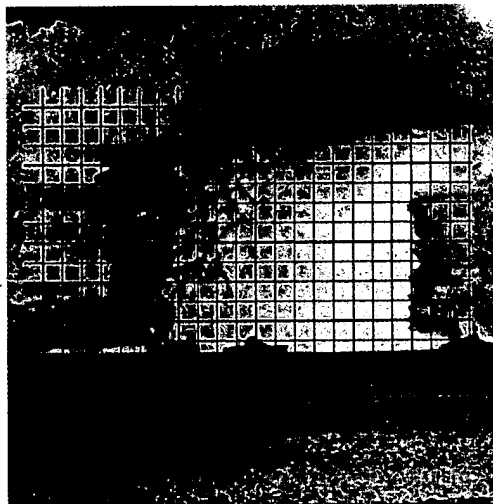
Such simulations could nullify opposition to the Nuclear Test Ban Treaty, which was never ratified by the U.S. Senate.

The \$110 million ASCI White processes 12.3 tril-

lion operations per second. That is equivalent to the combined performance of the next four largest supercomputers, according to IBM officials. It is 1,000 times more powerful than IBM's Deep Blue supercom-

puter, which defeated chess champion Gary Kasparov in 1997.

The monster machine is equipped with 8,192 copper chips and occupies as much floor space as two basketball courts.



ASCI White will model nuclear explosions.

PROCESSORS

AMD's Athlon races on

SOME SAY IT CAN'T OR shouldn't be done, but Advanced Micro Devices is looking to an Athlon chip successor to bring 64-bit computing to desktop PCs.

Although not due until at least late next year, the Athlon replacement will run at 2GHz and faster and offer 64-bit memory addressing, officials said last week. It will be based on technology from AMD's 64-bit server chip, code-named Sledgehammer.

Those wanting desktop performance improvements in the short term can look to the Pentium 4. The chip, which was code-named Willamette and formally picked up the Pentium moniker last week, is due later this year at 1.4GHz. —ZDNN

Are handhelds an integral part of your IT infrastructure yet? Let me know at rob_o'regan@ziffdavis.com. John Dodge will return to this space next week.

"It's hard to be faster than paper."

—Jeff Hawkins, chief product officer of PDA maker Handspring, on the standard against which handheld applications are judged

